



Quick Guide



Utah Division of Emergency Services & Homeland Security

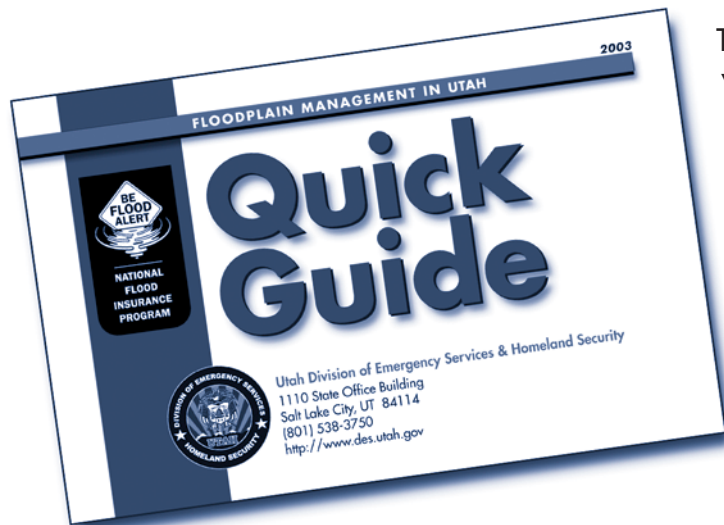
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About This Guide



This **Quick Guide** will help you understand more about why and how communities in the State of Utah manage floodplains to protect people and property. Flood-prone communities adopt ordinances that detail the rules and requirements. In case of conflict, that ordinance and not this publication, must be followed. If you have questions, be sure to talk with your local planning, permit, engineering office.

This **Quick Guide** was supported by funding from our partners at the Federal Emergency Management Agency (FEMA). The contents may not necessarily reflect the views and policies of the federal government.

Questions and comments on the **Quick Guide** can be directed to the floodplain management office of the Utah Division of Emergency Services & Homeland Security at (801) 538-3750.

Prepared by

RCQUINN
CONSULTING, INC.

www.rcquinnconsulting.com

To learn more about preparing for floods and cleaning up afterward, see the list of useful resources on [page 49](#).

Introduction

The Utah Division of Emergency Services & Homeland Security is pleased to provide this **Quick Guide** to help inform citizens whose properties are located within floodplains.

Communities regulate the floodplain to:

- **Protect** people and property
- **Ensure** that Federal flood insurance and disaster assistance are available
- **Save** tax dollars
- **Reduce** future flood losses

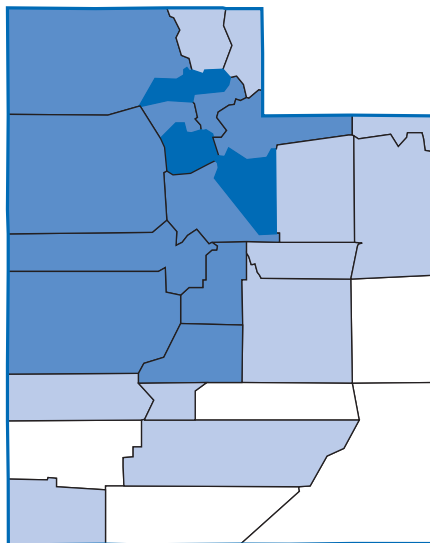
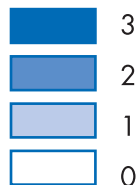
Floods have been, and continue to be, the most destructive natural disaster in terms of economic loss to the citizens of Utah. Nationwide, it is estimated that 10% of the land area is subject to flooding. Since 1978, Utah flood insurance policy holders have received nearly \$5 million in claim payments. Even though that represents many insurance payments, most flood-prone Utahans don't have flood insurance.



Utah Floodplain Facts

Presidential Disaster Declarations

**Number of
Declarations**
By County (1965-2001)



- Flood-prone areas have been identified in most counties, cities and towns in Utah.
- Major floods in Utah are almost always due to rapid snow melts and intense summer thunderstorms.
- Thousands of buildings and structures are located in mapped flood-prone areas, most in the Wasatch Front region.
- Federal, state, local government and private citizens paid more than \$500 million to recover from Utah's flood disasters in 1983 and 1984.
- Many waterways have not been mapped, but are still subject to flooding.

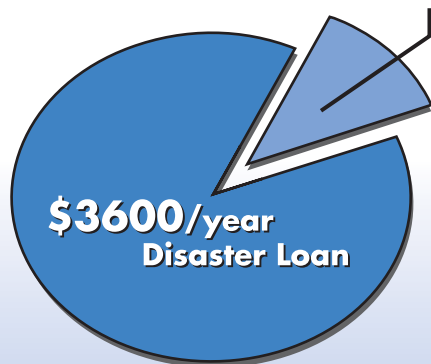
Not all flood events are declared major disasters. Many floods are local, affecting only small areas or a few watersheds.

Flood Insurance: Property Owner's Best Protection

Who needs flood insurance? Every homeowner, business owner, and renter in Utah communities that participate in the National Flood Insurance Program may purchase a flood insurance policy — regardless of the location of the building. Federal disaster grants do not cover most losses and repayment of a disaster loan can cost many times more than what you'll pay for a flood insurance policy.

COMPARE TYPICAL YEARLY COSTS

\$500/year Flood Insurance



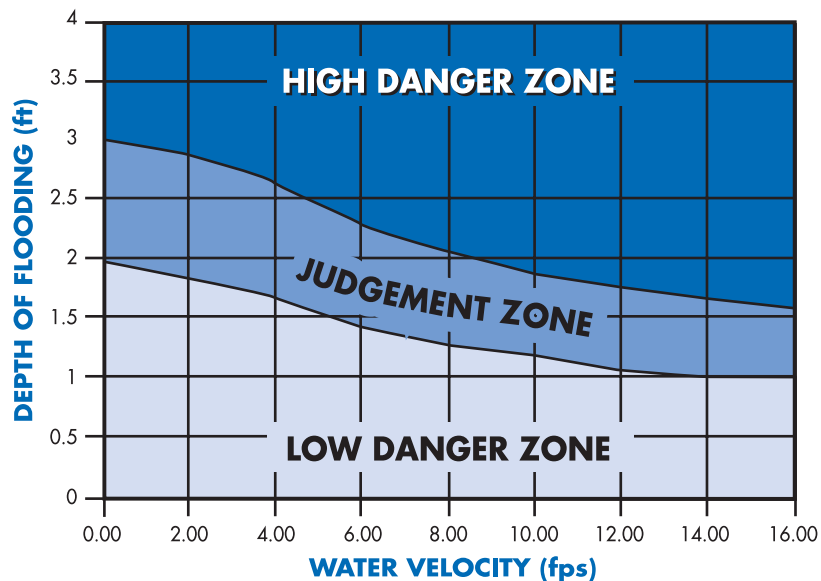
Call Your Insurance Agent to Learn More

Unfortunately, it's often after a flood that many people discover that their homeowner or business property insurance policies do not cover flood damages. Approximately 25% of all flood damages occur in low risk zones, commonly described as being "outside the mapped flood zone."

The State of Utah urges **YOU** to protect your financial future by getting a flood insurance policy. To purchase a policy, call your insurance agent. To get the name of an agent in your community, call the NFIP's toll free number 1 (888) 356-6329.

Be Flood Safe — Don't Drive Through Flooded Roads

Flood Hazard Chart for Cars



SOURCE: USBR, "Downstream Hazard Classification Guidelines," 1988

- Flooded roads may be washed out.
- Passenger cars may float in only 18-24 inches of water.
- Floating cars easily get swept downstream, making rescues difficult and dangerous.
- Each year, hundreds of people die in floods throughout the U.S – many are trapped in cars.

Flash floods are dangerous!

Do not try to walk or drive through fast-moving water.

Why Do We Regulate the Floodplain?

- **To protect people and property.** Floodplain management is about building smart. It makes good sense. If we know part of our land will flood from time to time, we should make reasonable decisions to help protect our families, homes, and businesses.
- **To make sure that federal flood insurance and disaster assistance are available.** If your home or business is in the floodplain, and federal flood insurance isn't available, then you can't get some types of federal financial assistance. Home mortgages will be hard to find, and you won't be able to get some types of state and federal loans and grants.
- **To save tax dollars.** Every flood disaster affects your community's budget. If we build smarter, we'll have fewer problems the next time the river rises. Remember, federal disaster assistance isn't available for all floods. And even when the President declares a disaster, your community still has to pay a portion of the costs of evacuation, temporary housing, repair, and clean-up.
- **To avoid liability and law suits.** If we know an area is mapped as floodplain and likely to flood, if we know people could be in danger, and if we know that buildings could be damaged, it makes sense to take reasonable protective steps when we develop and build.
- **To mitigate flood hazards and other natural and technological hazards,** Utah's hazard mitigation programs support planning efforts by counties, cities and towns.

Community Responsibilities

To participate in the National Flood Insurance Program, your community agrees to:

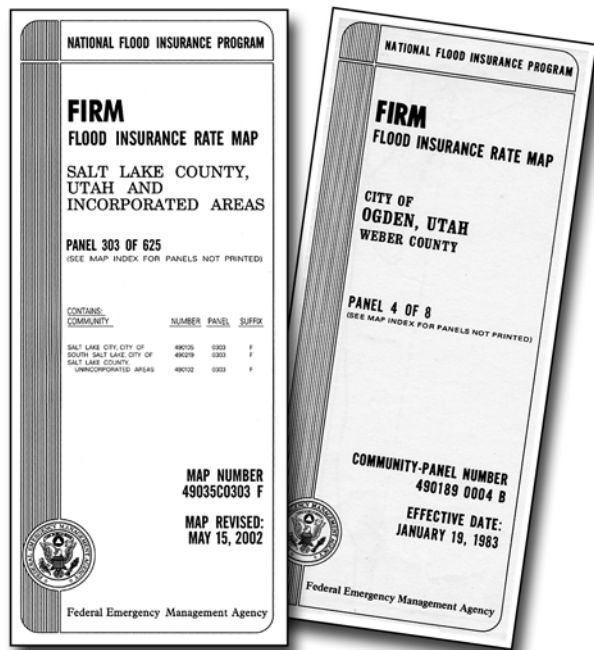
- **Adopt and enforce** a flood damage prevention ordinance
- **Require** permits for all types of development in the floodplain ([see page 18](#))
- **Assure** that building sites are reasonably safe from flooding
- **Estimate** flood elevations that were not determined by FEMA
- **Require** new or improved homes and manufactured homes to be elevated above the Base Flood Elevation (BFE)
- **Require** other buildings to be elevated or floodproofed
- **Conduct** field inspections and cite violations
- **Require** Elevation Certificates to document compliance (see [pages 27](#) and [28](#))
- **Carefully consider** requests for variances
- **Resolve** non-compliance and violations
- **Advise** FEMA when updates to flood maps are needed



**NATIONAL
FLOOD
INSURANCE
PROGRAM**

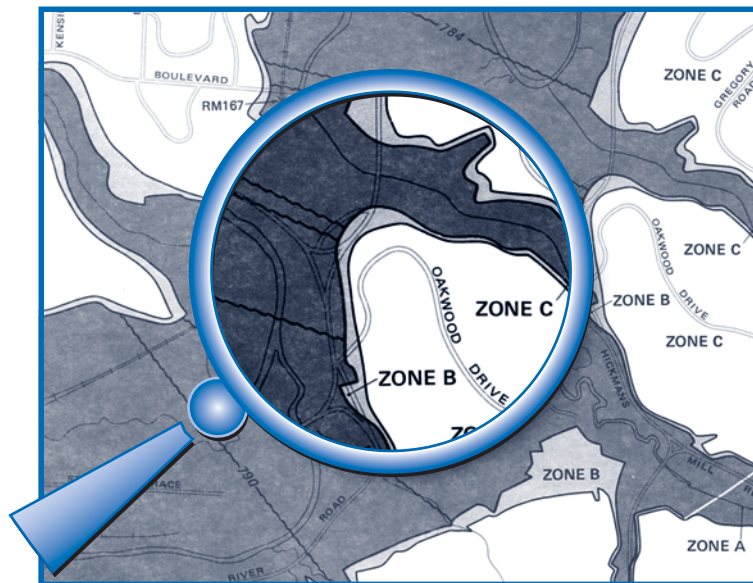
Looking for Floodplain Information?

Need a fast answer? Visit your community's planning or permit office where flood maps and flood studies are available for viewing by the public.



- FEMA prepares Flood Insurance Studies and **Flood Insurance Rate Maps (FIRMs)** for communities in Utah.
- Most FIRMs show Special Flood Hazard Areas and floodways. Some FIRMs show floodplains delineated using approximation analyses ([see page 16](#)).
- To view and/or order a flood map, visit the FEMA Flood Map Store at <http://store.msc.fema.gov>, or call (800) 358-9616 for additional information on FEMA's flood maps.
- Floodplain studies may be prepared by local governments, state and federal agencies, special districts, or by engineering companies working for private property owners and developers.
- Not all waterways have designated floodplains – but all waterways will flood, even though a floodplain study may not have been prepared.

F-MIT: Online Flood Map Image Tool



You can view and print clips from Flood Insurance Rate Maps for almost any place in the country by using FEMA's online tools at the FEMA Flood Map Store at <http://store.msc.fema.gov>.

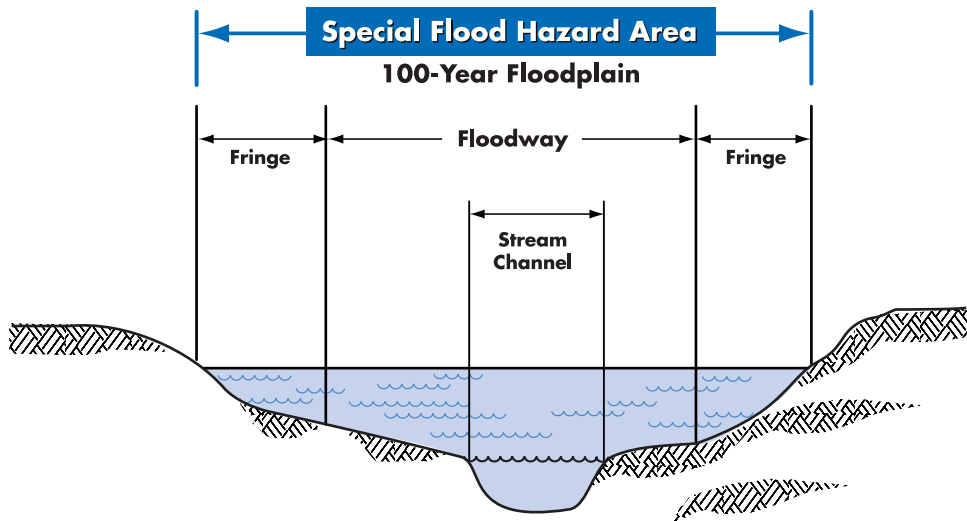
Several options are available:

- Print at exact scale (required for an "official" map).
- Print at different scales.
- Print a full panel (requires a plotter).
- Zoom in for detail.
- Save the graphic as an Adobe Acrobat (pdf) file.

You'll need to download software and graphic files – a fast computer connection helps!

Or you can purchase a CD-ROM with files for your community or state.

Understanding the Floodplain



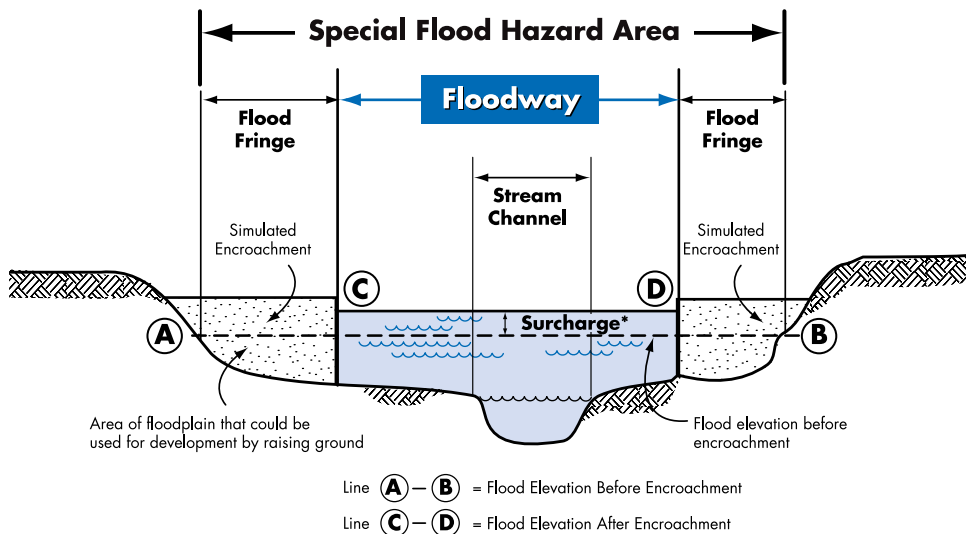
Terms and Definitions

The **Special Flood Hazard Area (SFHA)** is that portion of the floodplain subject to inundation by the base flood and/or flood-related erosion hazards. SFHAs are shown on FHBMs or FIRMs as Zones A, AE, A1-A30, AH, or AO.

[See page 11](#) to learn about the floodway, the area of the floodplain where floodwaters usually flow faster and deeper.

For floodplains with Base Flood Elevations, check the Flood Insurance Study to find the Flood Profile which shows water surface elevations for different frequency floods ([see page 15](#)).

Understanding the Floodway



*Surcharge not to exceed 1.0 foot [FEMA requirement]

 Simulated Encroachment

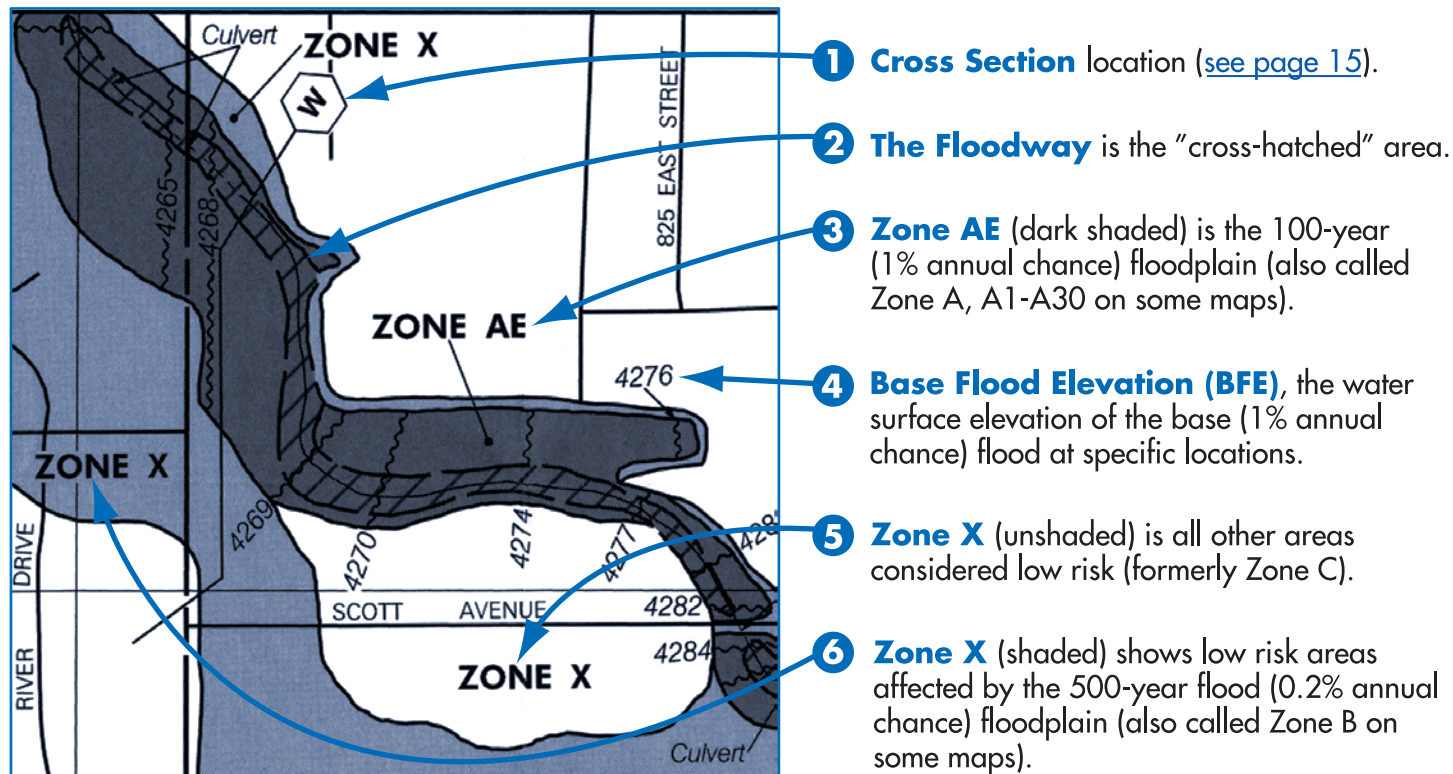
Terms and Definitions

The **Floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to pass the base flood discharge without increasing flood depths.

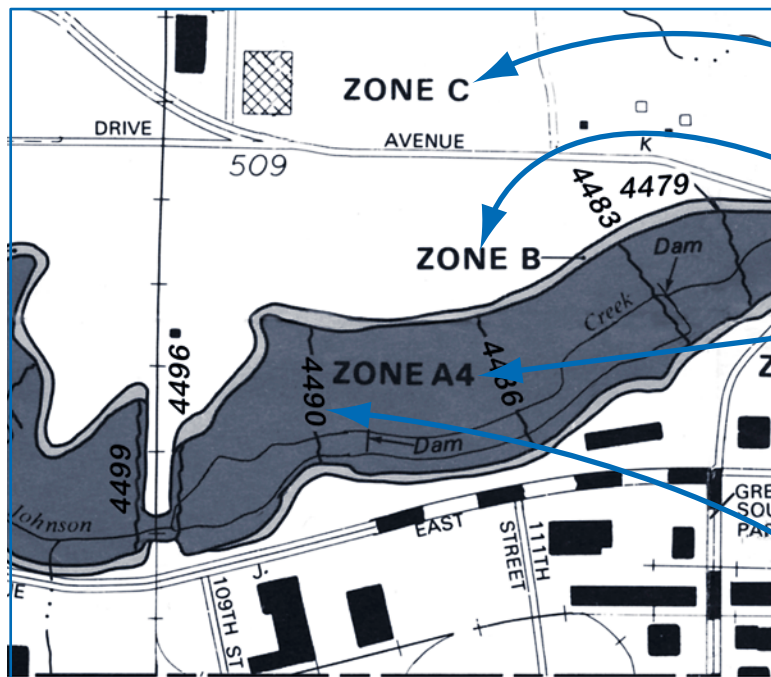
Computer models of the floodplain are used to simulate "encroachment" or fill in the flood fringe in order to predict where and how much the base flood elevation would increase if the floodplain is allowed to be filled.

For any proposed floodway development, before a local floodplain permit can be issued, the applicant must provide evidence that "no rise" will occur ([see page 30](#)). You may need a qualified engineer to make sure your proposed project won't increase flooding on other properties.

New Format Flood Insurance Rate Map



Old Format Flood Insurance Rate Map

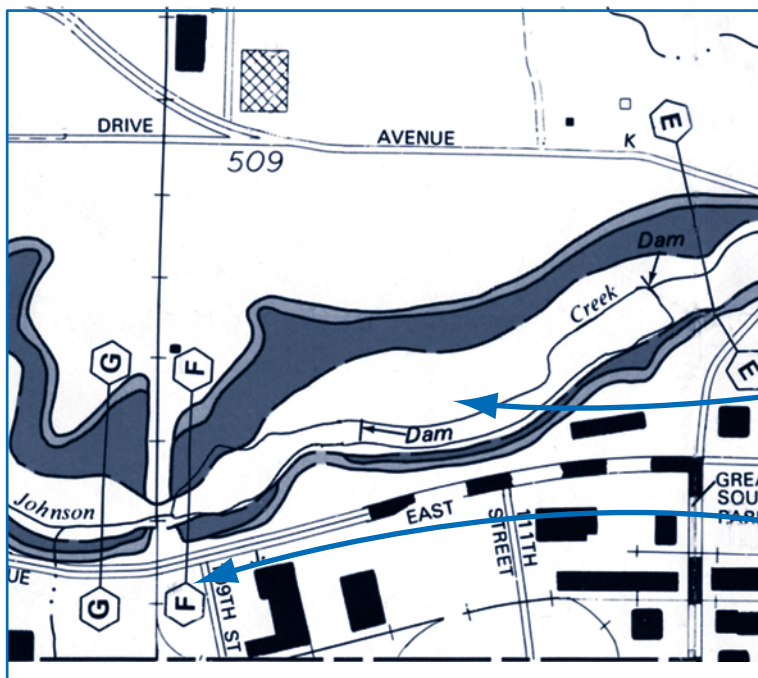


FLOOD HAZARD ZONES

- 1 Zone C** (or Zone X) is all other areas, considered to be low-risk.
- 2 Zone B** (or shaded Zone X) is subject to flooding by the 500-year flood (0.2% annual chance), and is a moderate risk area.
- 3 Zone A, Zones A1-A30 and Zone AE** are subject to flooding by the base or 100-year flood (1% annual chance), and are considered high-risk areas.
- 4 Base Flood Elevation (BFE).** Water surface elevation of the base flood at specific locations.

FEMA prepares Flood Insurance Rate Maps (FIRMs) to show areas that are at high risk of flooding after intense or major storms. Many FIRMs show the flood elevation (how high the water may rise), called the Base Flood Elevation.

Old Format Flood Boundary and Floodway Map



Important

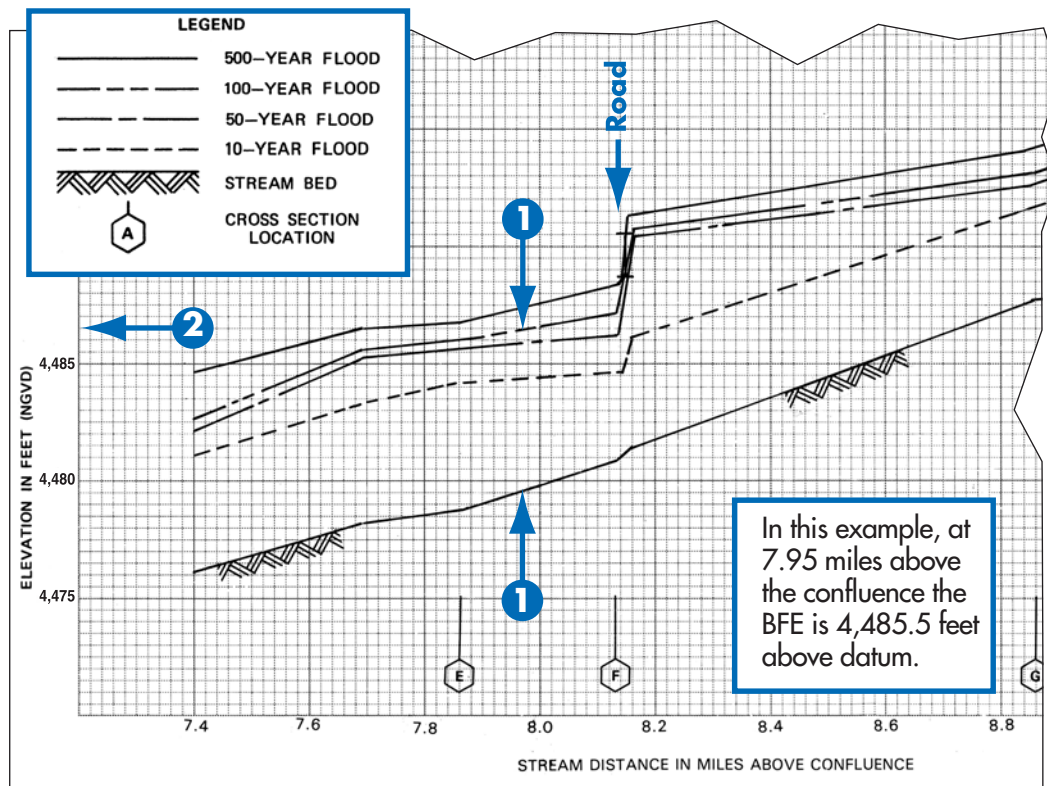
Information

Floodway maps do not show flood zones or BFEs. Check the companion FIRM for that information. [Page 13](#) shows the FIRM that matches the map clip to the left.

- 1 The Floodway** is the “white” area along the waterway.
- 2 Cross Section** location, where ground surveys determined the shape of the land and how constrictions such as bridges and culverts affect the flow of floodwater.

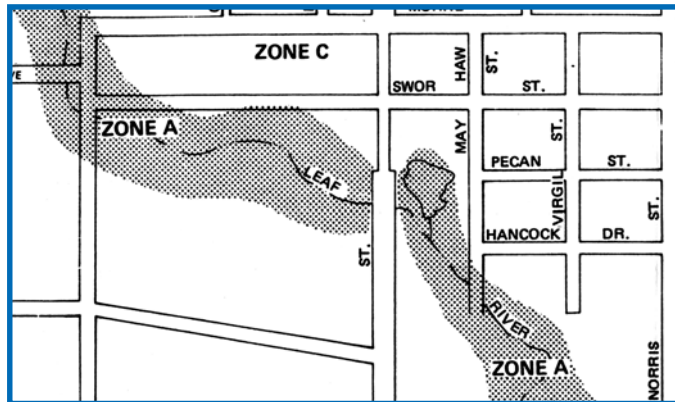
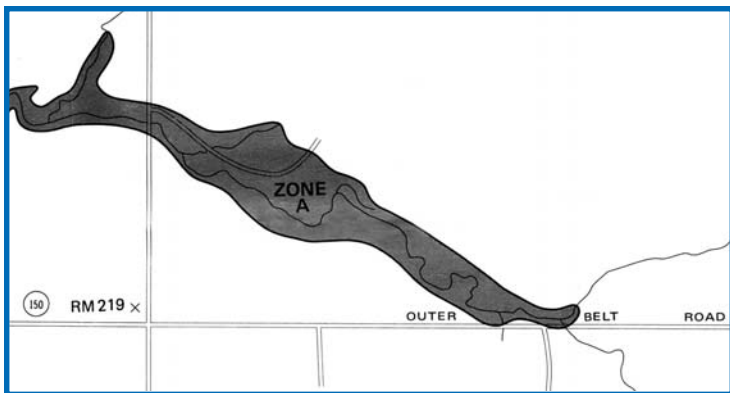
FEMA prepares Floodway maps as companions to many FIRMs. You should check to see if your project will be in the Floodway because additional engineering may be required ([see page 30](#)).

Use the Flood Profile to Determine BFEs



Approximate Flood Zones and Unnumbered A Zones

Approximate flood zones are drawn based on existing information and approximation methods. Sometimes new flood studies are required in order to delineate the floodplain and determine the Base Flood Elevation. Other sources of floodplain information include the county soil conservation district offices, U.S. Army Corps of Engineers, the U.S. Geological Survey, and the Utah Department of Transportation.



If you need help determining the BFE, check with your community permit office.

FEMA publication *Managing Floodplain Development in Approximate Zone A Areas* (FEMA 265) is useful for engineers and surveyors.

Download this document at <http://www.fema.gov/nfip/statelocpub.htm>.

Flood Map Revisions Issued by FEMA

1. **Letter of Map Amendment (LOMA)** is an official amendment to an effective FIRM that may be issued when a property owner provides additional technical information, such as ground elevation relative to the BFE, SFHA, and the building. Lenders may waive the flood insurance requirement if the LOMA documents that a building is on ground above mapped floodplain.
2. **Letter of Map Revision (LOMR)** is an official revision to an effective FIRM that may be issued to change flood insurance risk zones, floodplain and floodway boundary delineations, BFEs and/or other map features. Lenders may waive the insurance requirement if the approved map revision shows buildings to be outside of the SFHA.
3. **Letter of Map Revision Based on Fill (LOMR-F)** is an official revision to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated by fill above the BFE, and therefore is no longer in the SFHA. Lenders may waive the insurance requirement if the LOMR-F shows that a building on fill is above the BFE.
4. **Physical Map Revision (LOMR PMR)** may be issued for major floodplain changes that require engineering analyses, such as bridges, culverts, channel changes, flood control measures, and large fills that change the BFE or Floodway. Physical map revisions are also issued when a new study updates or improves the FIRM.



Important

Information

Check FEMA's Flood Hazard Mapping Web Site for more information about map revisions concerning Homeowners



and Engineers/Surveyors.



www.fema.gov/fima/
Click on "Flood Hazard Mapping".

Requests for map revisions must be coordinated through your community.

Activities Requiring Permits Include:

- Constructing new buildings
- Additions to existing buildings
- Substantially improving existing buildings
- Placing manufactured (mobile) homes
- Subdivision of land
- Temporary buildings and accessory structures.
- Agricultural buildings
- Parking or storage of recreational vehicles
- Temporary or permanent storage, including gas/liquid tanks and sand/gravel
- Roads, bridges, and culverts
- Fill, grading, excavation, mining, and dredging
- Altering stream channels



YOU NEED PERMITS FOR **ALL** OF THESE ACTIVITIES.

Safe Uses of the Floodplain

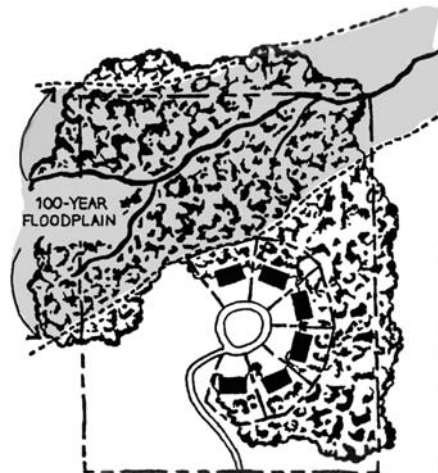
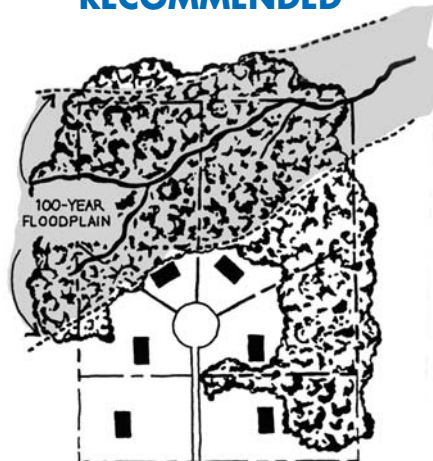


All land subdivided into lots, some homesites and lots partially or entirely in the floodplain.

NOT RECOMMENDED

All land subdivided into lots, some lots partially in the floodplain, setbacks modified to keep homesites on high ground.

RECOMMENDED

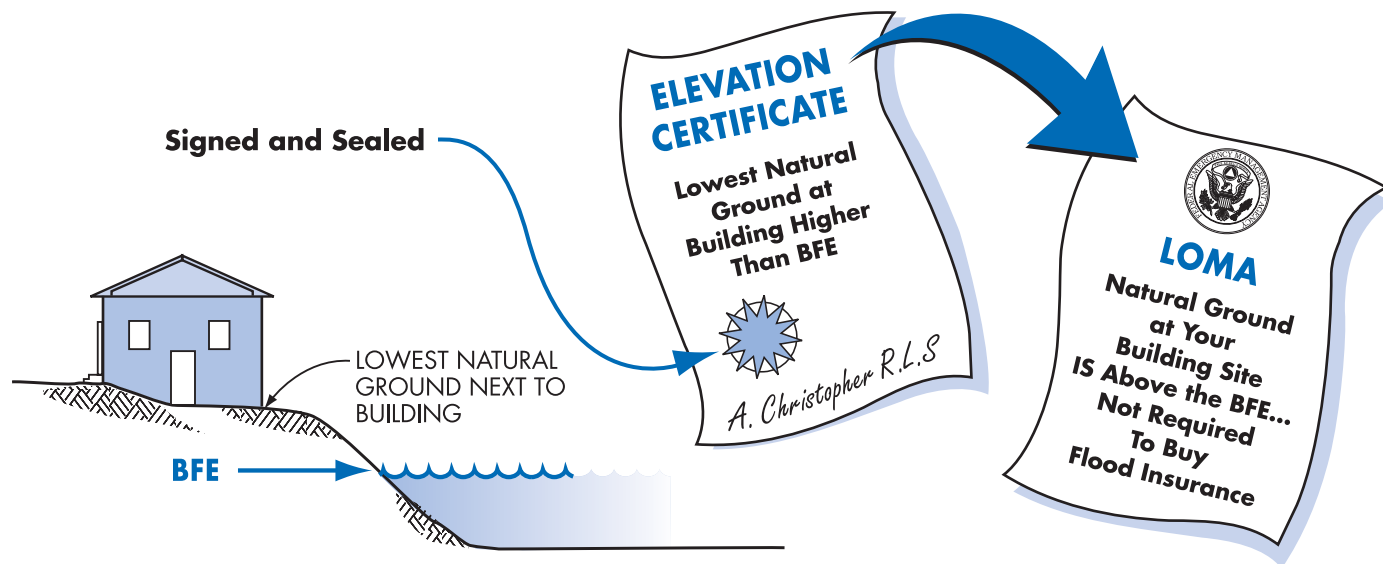


Floodplain land put into public/common open space, net density remains, lot sizes reduced and setbacks modified to keep homesites on high ground.

RECOMMENDED

Let the floodplain do its job – if possible, keep it natural open space. Other low damage uses: recreational areas, playgrounds, reforestation, parking, gardens, pasture, accessory structures, created wetlands.

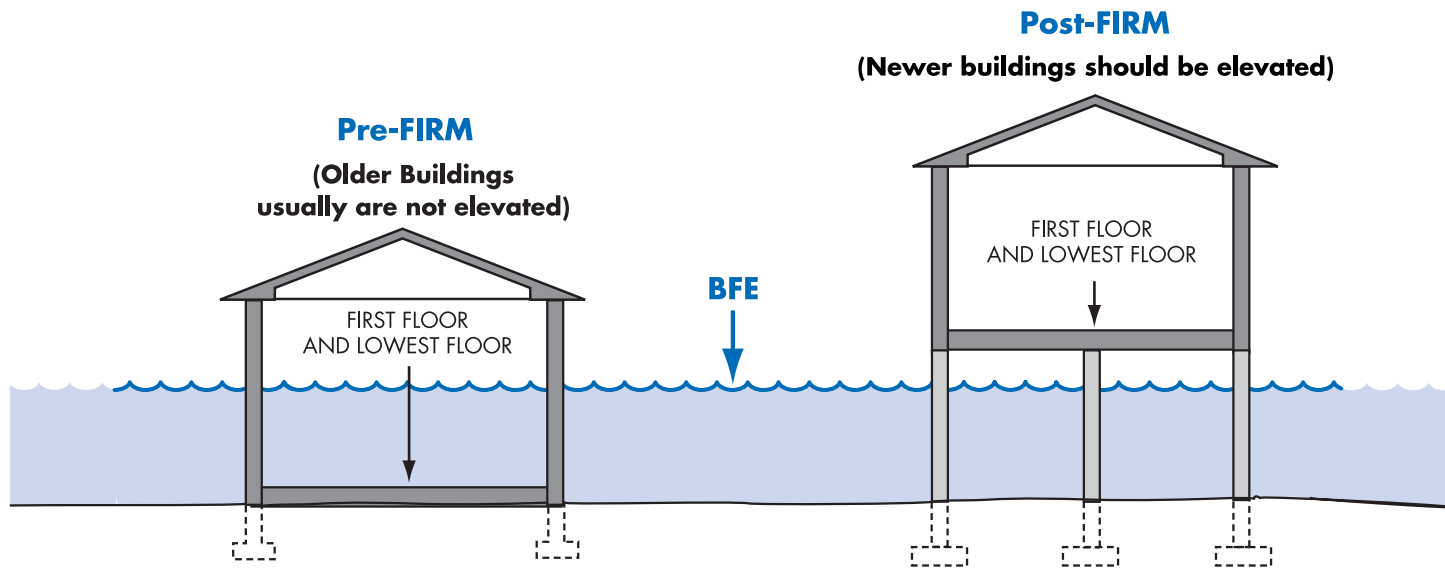
Is Your Building Site Higher than the BFE?



If your land is shown on the map as "in" the floodplain, but the natural grade of your building site is higher than the Base Flood Elevation (BFE)... get a surveyor or engineer who is authorized to certify elevations to complete a FEMA Elevation Certificate (EC). Submit the EC with an application to FEMA and a Letter of Map Amendment may be issued ([page 17](#)). This is the **ONLY** way to remove the requirement to buy flood insurance.

Keep the certificate with your deed, it will help future buyers.

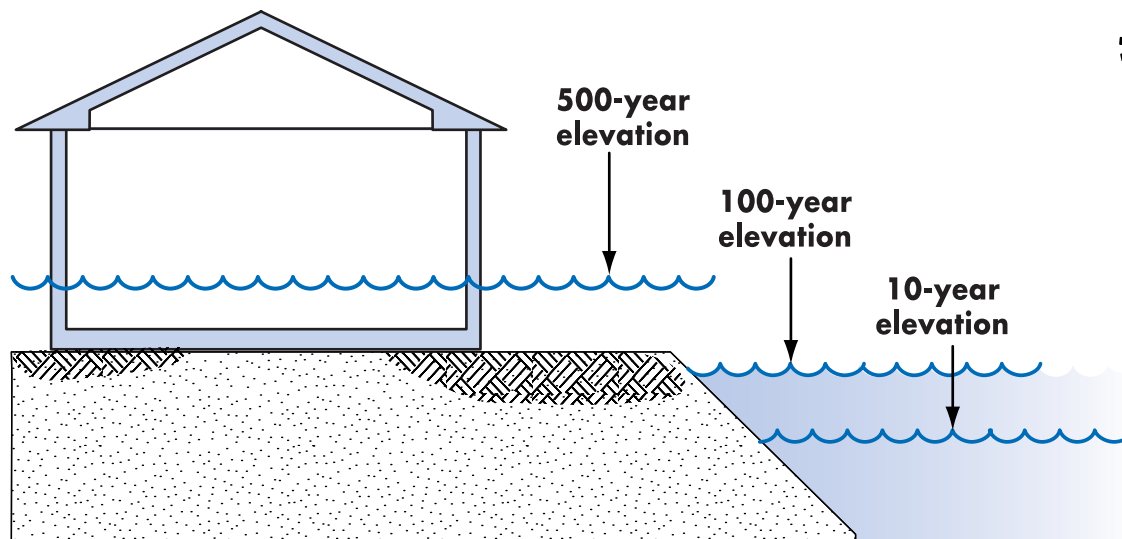
What is Meant by Pre-FIRM and Post-FIRM?



A building is **Pre-FIRM** if it was built before the date of your community's first FIRM.
If built after that date, a building is **Post-FIRM**.

Improvements or repairs to Pre-FIRM buildings may require permits (see [pages 42](#) and [43](#)).

Nature Doesn't Read Maps



Important

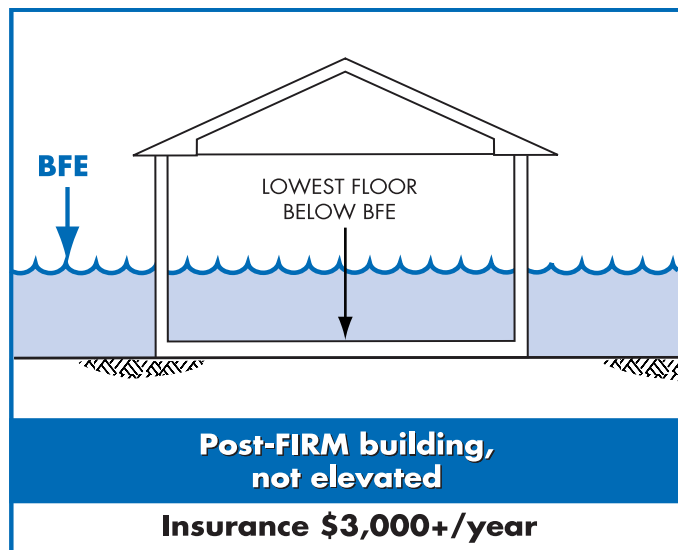
Information

Many people don't understand just how risky the floodplain can be. There is a 26% chance that a non-elevated home in the floodplain will be damaged during a 30-year mortgage period. The chance that a major fire will occur during the same period is only 1%!

CAUTION! Nature doesn't read the flood map! Major storms and flash floods can cause flooding that rises higher than the 100-year elevation (BFE). Consider safety – protect your home or business by building higher.

[See page 26](#) to see how this will save you money on insurance.

Think Carefully Before You Seek A Variance



Very specific conditions must be satisfied to justify a variance:

- Good and sufficient cause
- Unique site conditions
- Individual non-economic hardship
- If in the floodway, no increase in flood level

A variance that allows construction below the BFE does not waive your lender's flood insurance requirement. Flood insurance will be very expensive – perhaps more than \$3,000 per year ([see page 26](#))!

Think carefully about seeking a variance to build below the Base Flood Elevation. Not only will your property be more likely to get damaged, but insurance will be very costly.

If your community has a pattern of inconsistent variances, FEMA can impose sanctions. – costing you even more!

Some Key Permit Review Steps

The Permit Reviewer has to Check Many Things. Some of the Key Questions are:

- Is the site in the mapped floodplain?
- Is the site in the mapped floodway?
- Have other state and federal permits been obtained?
- Is the site "reasonably safe from flooding"?
- Does the site plan show the Base Flood Elevation?
- Is substantial improvement of an older building proposed?
- Is an addition proposed?
- Will new buildings and utilities be elevated properly?
- Will manufactured homes be properly elevated and anchored?
- Do the plans show an appropriate and safe foundation?
- Has the owner agreed to submit an Elevation Certificate?



Carefully Complete the Permit Application



Important

Information

You must get a permit **before** you do work in a floodplain

FLOODPLAIN DEVELOPMENT PERMIT (partial)

OWNER DAVID & SALLY JONES

ADDRESS 781 REED STREET

PROJECT DESCRIPTION

☒ Single Family Residential

☐ Multi-Family Residential

☐ Manufactured (Mobile) Home

☐ Non-Residential

☐ Other/Explanation _____

☒ New Construction

☐ Substantial Improvement (>50%)

☐ Improvement (<50%)

☐ Rehabilitation

☐ Channelization

☒ Fill

☐ Bridge/Culvert

☐ Levee

FLOOD HAZARD DATA

Watercourse Name DRY RIVER

The project is proposed in the _____ Floodway ☒ Floodway Fringe

Base (100-year) flood elevation(s) at project site 4,229.2

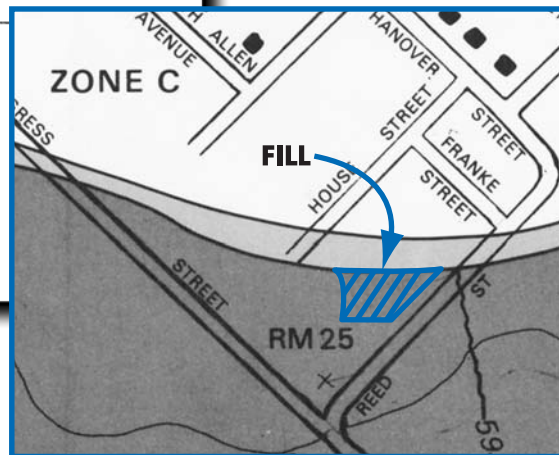
Elevation required for Lowest Floor 4,250.2 /Floodproofing _____

Rebecca Reviewer

Floodplain Administrator's Signature

9/2/2002

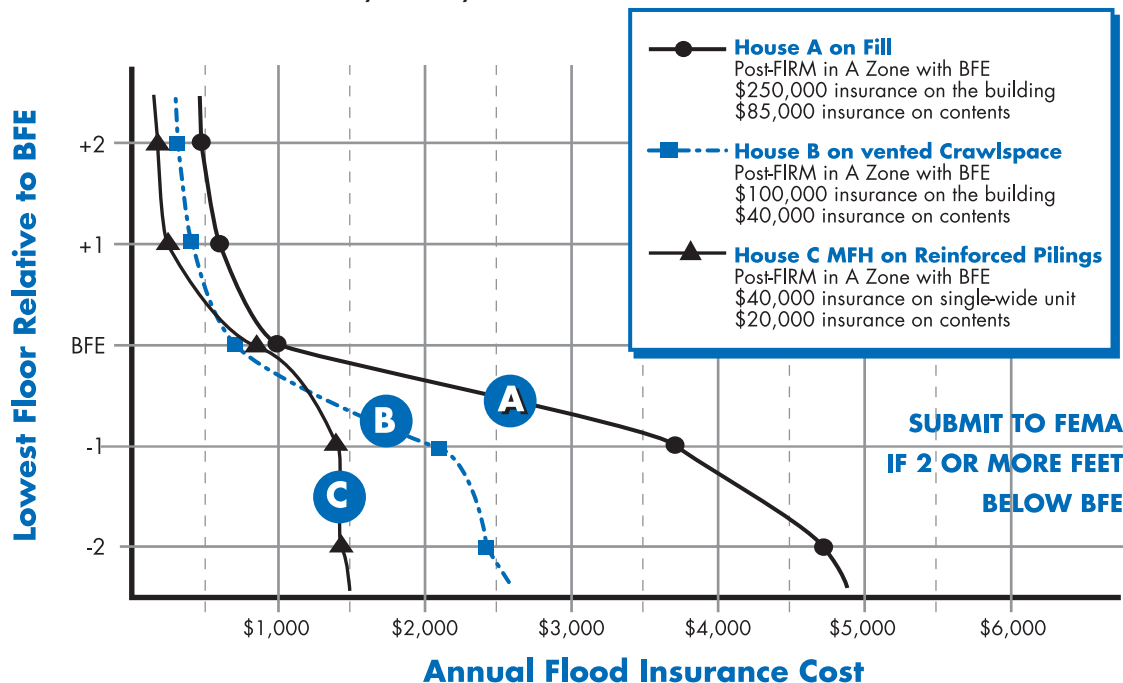
Date



Good information will lead to better construction and less exposure to future flood damage.

Freeboard: Go the Extra Foot!

Want to save some money and have peace of mind at the same time?
Then add Freeboard to build higher than the minimum elevation requirement!
Freeboard is a factor of safety, usually one or two feet above the BFE.



Important

Information

NOTE: Flood insurance rates and various fees change from time to time. Rather than specific costs for insurance, this figure gives a feel for how much difference just a foot or two can make.

Building owners will save insurance money if they elevate above the BFE. But more impressive is how the cost of insurance can more than double if the building is only one foot below the BFE.

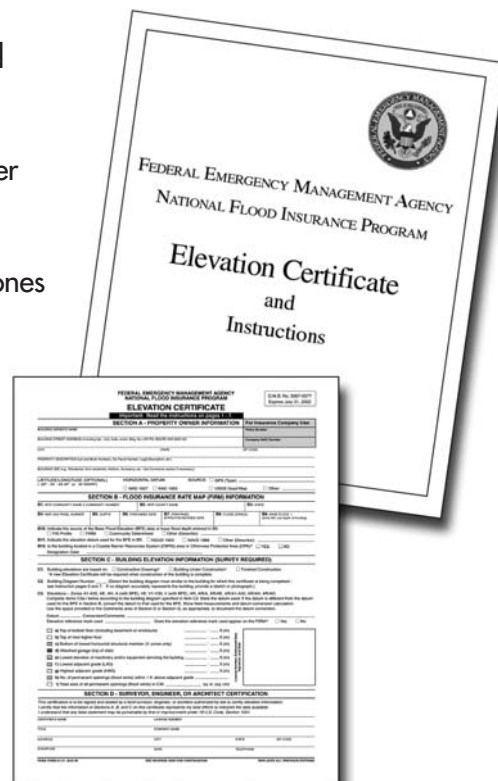
Remember!

The community may be able to grant a variance, but the owner will probably still be required to buy insurance. Imagine trying to sell a house if the bank requires insurance that costs over \$2,000 a year!

What is the Elevation Certificate and How is it Used?

- The Elevation Certificate (EC) is a FEMA form. Go to www.fema.gov and search for "Elevation Certificate."
- The EC must be completed and sealed by a registered surveyor or engineer when the floodplain has BFEs.
- A community official may complete the EC for sites in AO zones and A zones without BFEs.
- It can be used to show that sites are natural ground above the Base Flood Elevation ([see page 20](#)).
- It is used to verify that buildings are elevated properly ([see page 29](#)).
- Insurance agents use the EC to write flood insurance policies.

By itself, the EC cannot be used to waive the requirement to get flood insurance. [See page 17](#) to learn about Letters of Map Amendment.



Completing the Elevation Certificate

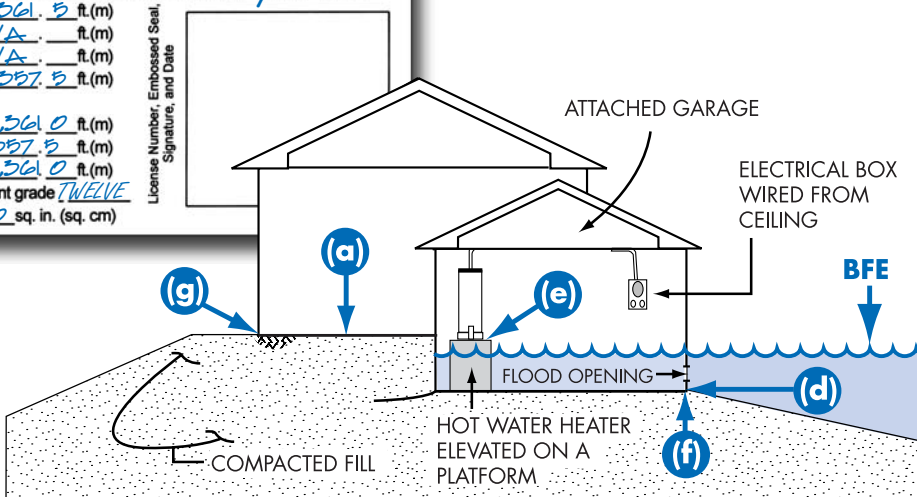
ELEVATION CERTIFICATE (partial)	
Important: Read the instructions on pages 1–7	
SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)	
Elevation reference mark used <u>B.M. 166</u>	Does the elevation reference mark used appear on the FIRM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> a) Top of bottom floor (including basement or enclosure)	<u>4,561.5</u> ft.(m)
<input type="checkbox"/> b) Top of next higher floor	<u>N/A</u> ft.(m)
<input type="checkbox"/> c) Bottom of lowest horizontal structural member (V zones only)	<u>N/A</u> ft.(m)
<input type="checkbox"/> d) Attached garage (top of slab)	<u>4,557.5</u> ft.(m)
<input type="checkbox"/> e) Lowest elevation of machinery and/or equipment servicing the building	<u>4,561.0</u> ft.(m)
<input type="checkbox"/> f) Lowest adjacent grade (LAG)	<u>4,557.5</u> ft.(m)
<input type="checkbox"/> g) Highest adjacent grade (HAG)	<u>4,561.0</u> ft.(m)
<input type="checkbox"/> h) No. of permanent openings (flood vents) within 1 ft. above adjacent grade	<u>TWELVE</u>
<input type="checkbox"/> i) Total area of all permanent openings (flood vents) in C3h	<u>1,280</u> sq. in. (sq. cm)

License Number, Embossed Seal, Signature, and Date

Elevation Certificate (partial)

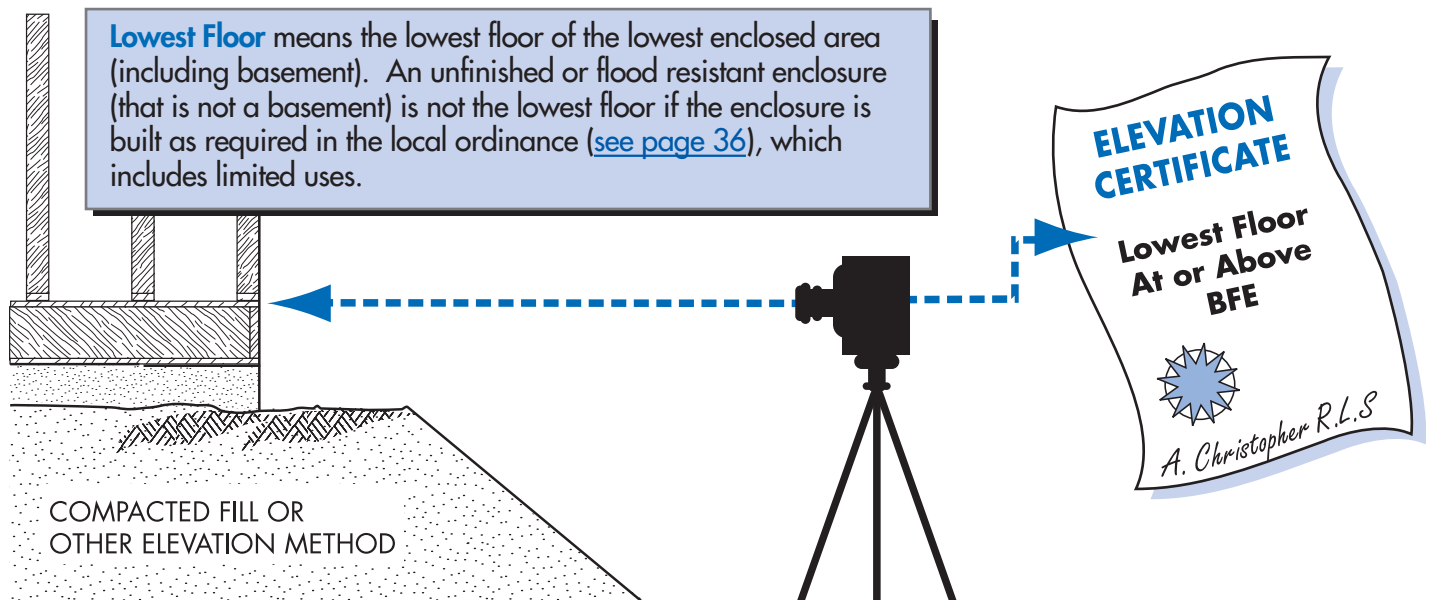
In this example, the BFE is 4,360.

The slab-on-grade house was elevated on fill 1' above the BFE, and the vented garage is 2.5' below the BFE.



You may get a blank Elevation Certificate form when you get your permit. You **must** have a surveyor or engineer fill it out and seal it. The Elevation Certificate includes diagrams for eight building types. Several points must be surveyed.

Paperwork is Important – for You and Your Community



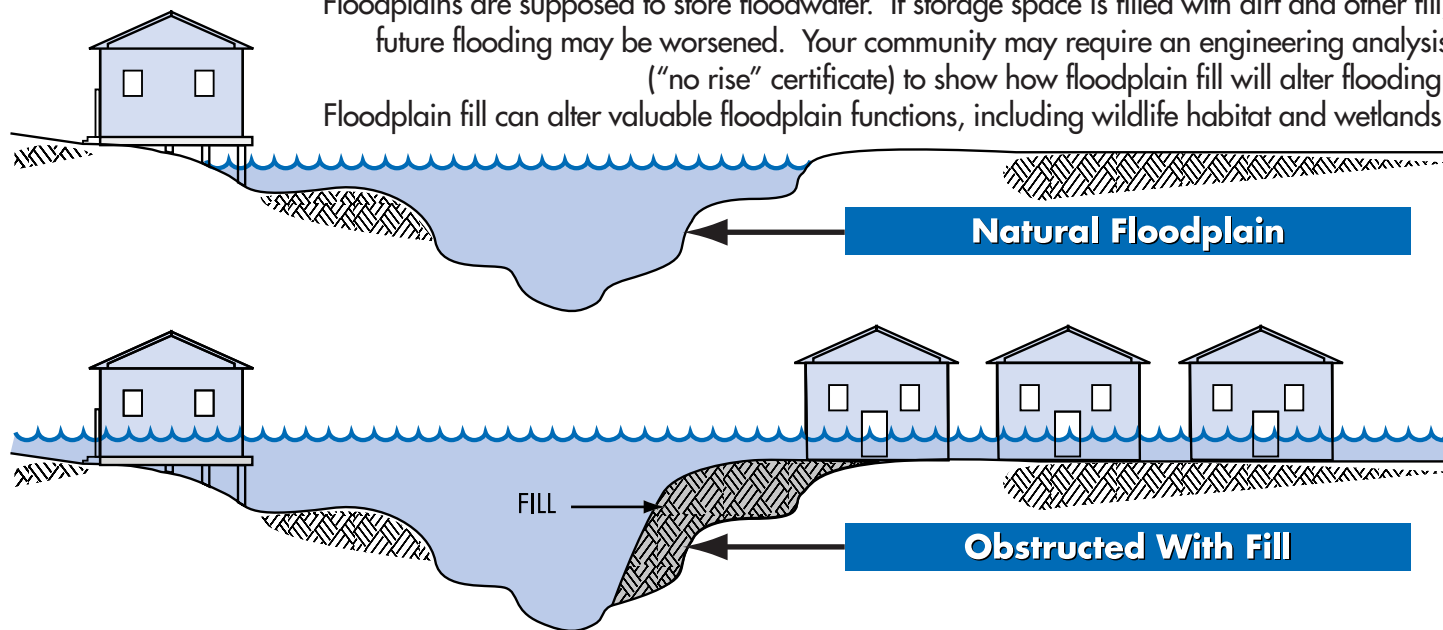
If you get a permit to build in the floodplain, you will be given an Elevation Certificate form. As soon as your lowest floor is set, get the form filled out and sealed by an authorized professional.

This form is important!

It proves that you built correctly, and it can be used to get the lowest cost flood insurance.

Floodplain Fill Can Make Things Worse

Floodplains are supposed to store floodwater. If storage space is filled with dirt and other fill, future flooding may be worsened. Your community may require an engineering analysis (“no-rise” certificate) to show how floodplain fill will alter flooding. Floodplain fill can alter valuable floodplain functions, including wildlife habitat and wetlands.



Make sure your floodplain fill project won't harm your neighbors. Floodway fill is allowed **only** if an engineering evaluation demonstrates that “no-rise” in flood level will occur ([see page 31](#)).

Recommended Floodway “No Rise” Certification

- Floodways can be dangerous because water may flow very fast
- Development is not allowed unless “no rise” in flood levels is certified
- An engineer must evaluate the hydraulic impact of proposed development
- A “no rise” certification is recommended and must be signed, sealed, and dated by a registered professional engineer
- Check with your community or the Utah floodplain management office for guidance **before** you decide to work in a floodway

ENGINEERING “NO-RISE” CERTIFICATION *(example)*



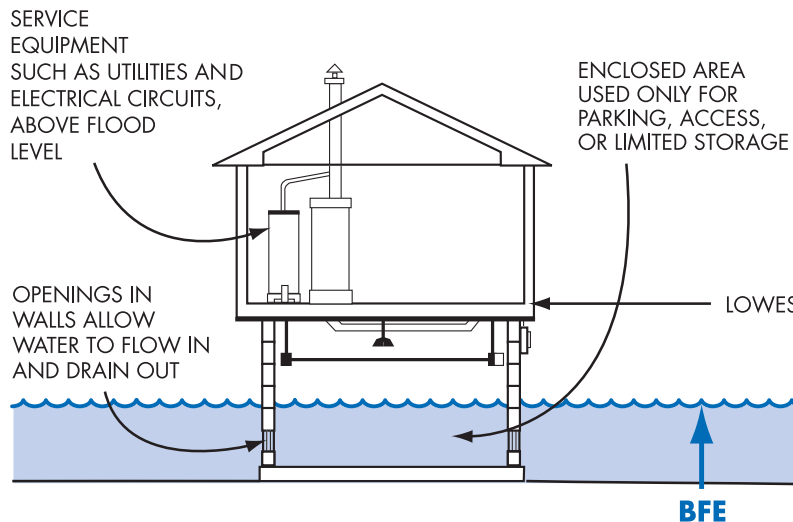
This is to certify that I am a duly qualified engineer licensed to practice in the State of Utah. It is to further certify that the attached technical data supports the fact that proposed **(Name of Development)** will not impact the Base Flood Elevations (100-year flood), floodway elevations and the floodway widths on **(Name of Stream)**.

Signature _____ Seal _____

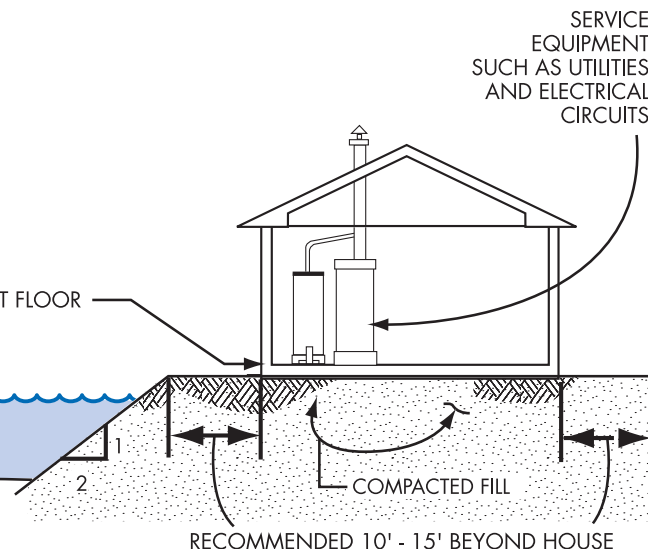
The engineering analysis must be based on technical data obtained from FEMA.
Save time and money – don’t build in the floodway!

How to Elevate Your Floodplain Building

Elevate on Foundation Walls



Elevate on Fill

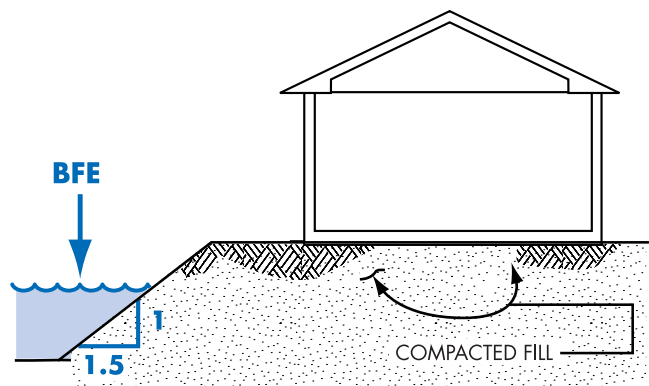


CAUTION! Enclosures (including crawlspaces) have some special requirements, [see page 36](#). Note: When the walking surface of the lowest floor is at the minimum elevation, under-floor utilities and ductwork are not allowed. Fill used to elevate buildings must be placed properly ([see page 33](#)).

Compaction of Floodplain Fill

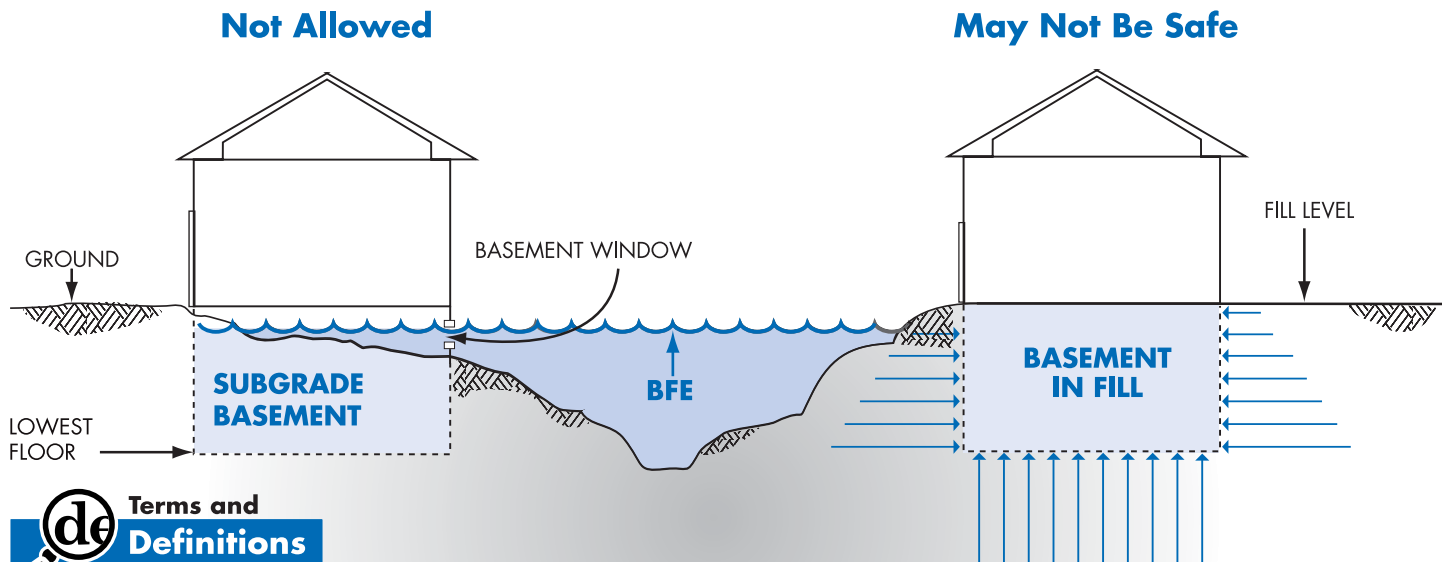
Earthen fill used to raise the ground above the flood elevation must be placed properly so that it does not erode or slump when water rises. For safety and to meet floodplain requirements, floodplain fill should:

- Be good clean soil, free of large rocks, construction debris, and woody material (stumps, roots)
- Be machine compacted to 95 percent of the maximum density (determined by design professional)
- Have graded side slopes that are not steeper than 1:1.5 (one foot vertical rise for every 1.5 feet horizontal extent)
- Have slopes protected against erosion (vegetation for "low" velocities, durable materials for "high" velocities – determined by design professional)



Your community may ask for certification of the elevation, compaction, slope, and slope protection materials.
Your engineer or design professional can find more information in FEMA's technical guidance (MT-1).

Basements Are Unsafe

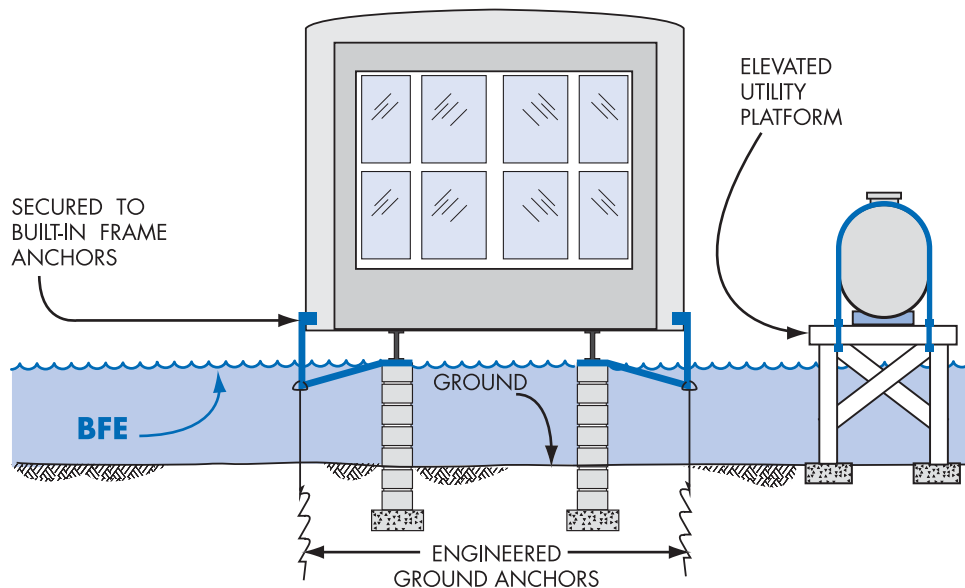


Terms and Definitions

A **basement** is any portion of a building that has its floor sub-grade (below ground level) on all sides.

New basements below the BFE are not allowed. An inch of water over the sill and the entire basement can fill. Excavating a basement into fill doesn't always make it safe because pressure from saturated ground can damage the walls.

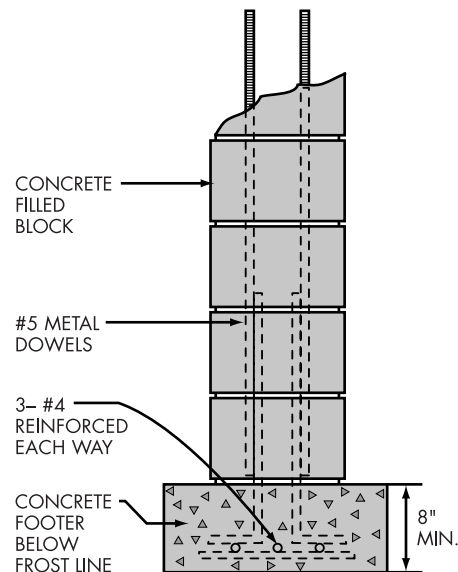
Manufactured Homes Deserve Special Attention



Manufactured homes must be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with your community's ordinance or the manufacturers' installation specifications.

Experience shows that manufactured homes are easily damaged. As little as one foot of water can cause substantial damage.

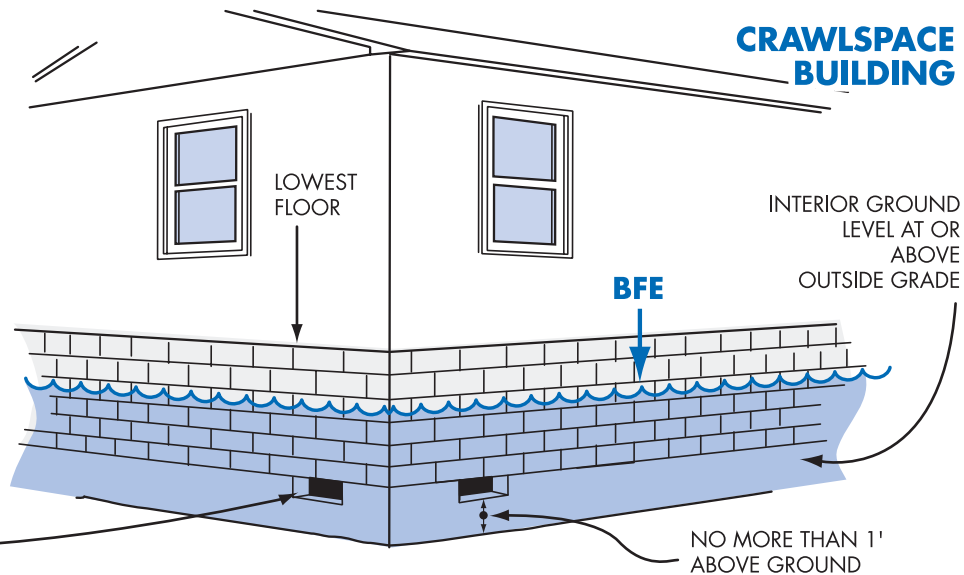
Dry stacked blocks are not acceptable — they will **NOT** withstand a flood.



Crawlspace Enclosures Below the BFE

NOTE:

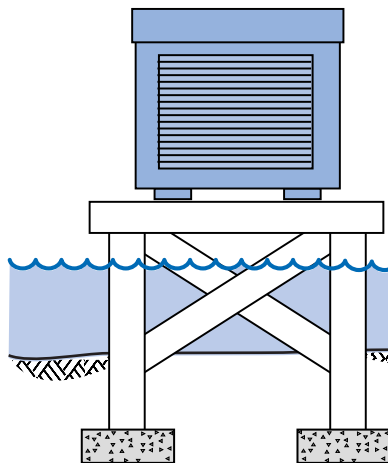
- AREA OF ALL TOTAL OPENINGS IS 1 SQ. IN. FOR EACH SQ. FT. OF ENCLOSED AREA
- A 25' X 45' BUILDING NEEDS 1125 SQ. INCHES OF OPENINGS
- STANDARD VENTILATION UNITS USED IN BLOCK FOUNDATION WALLS MUST BE DISABLED IN THE OPEN POSITION TO ALLOW WATER TO FLOW IN AND OUT
- A STANDARD VENTILATION UNIT, WITH SCREEN, PROVIDES 42 SQ. INCHES OF OPENING



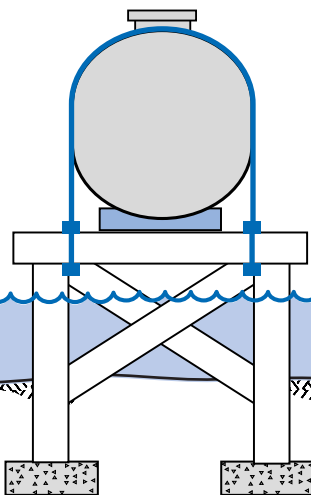
Solid perimeter wall foundations can enclose flood-prone space. A crawlspace is a good way to elevate just a couple of feet. In all cases, the following are required: openings/vents, elevated utilities and ductwork, flood resistant materials, and limitations on use.

Utility Service Outside Buildings

**Heat Pump or A/C
on Platform**



**Fuel or Propane Tank
Anchored on Platform**

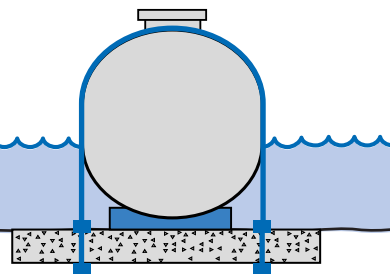


Important

Information

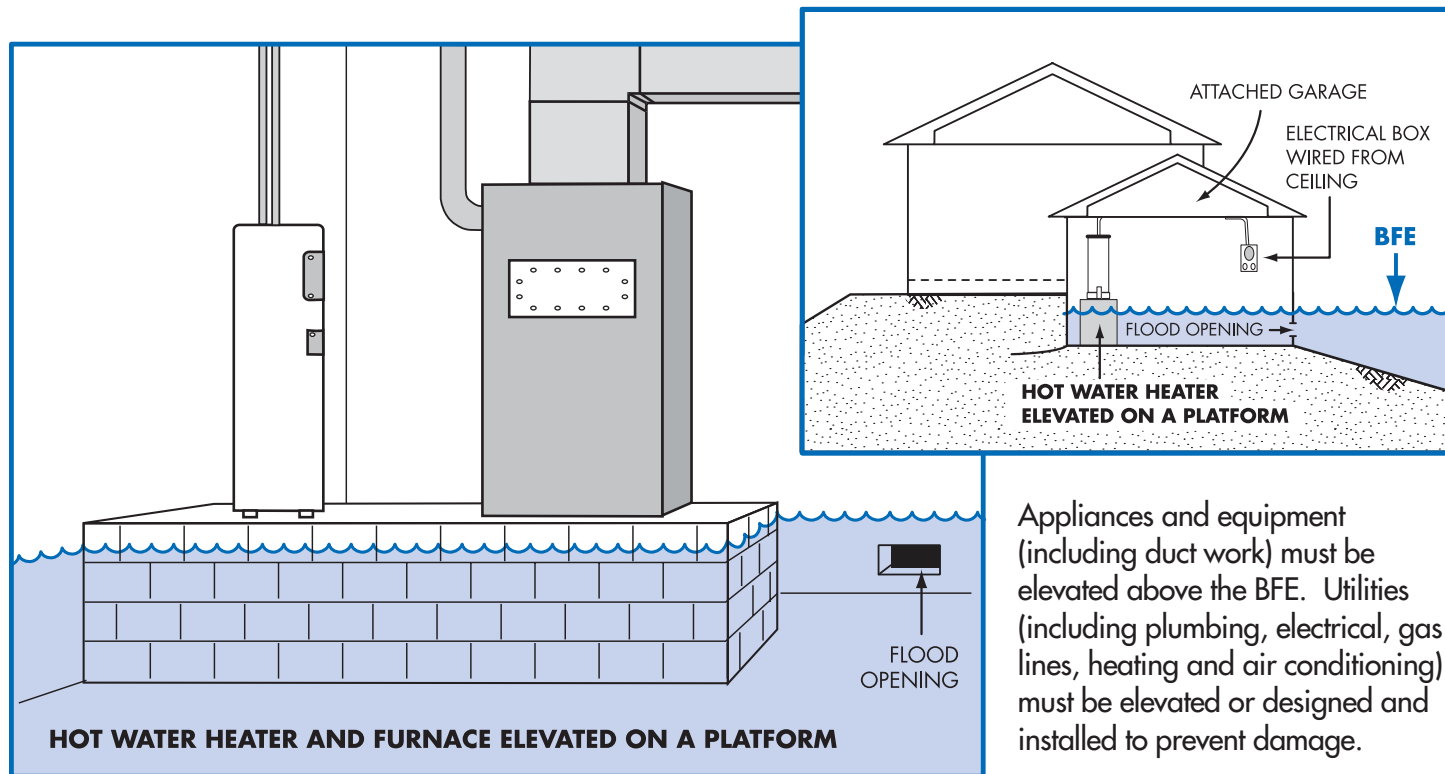
Fuel and propane tanks may cause explosion and pollution risks during flood conditions! Even shallow water can create large buoyant force on tanks, so extra care must be taken to ensure that all tanks are anchored.

**Fuel or Propane Tank
Anchored to Prevent Flotation**



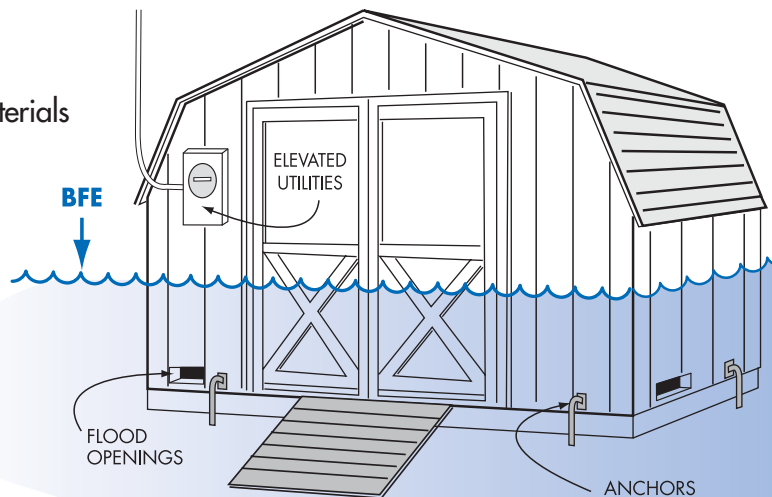
Whether inside an attached garage or outside the building, all utilities, appliances and equipment must be elevated above the BFE or protected against flood damage. Utilities include plumbing fixtures, electrical equipment, gas lines, fuel tanks, and heating and air conditioning equipment.

Utility Service Inside Enclosures



Accessory (Appurtenant) Structures

- Not habitable
- Anchored to resist floating
- Flood openings/vents
- Built of flood resistant materials
- Elevated utilities
- Used only for storage or parking
- Cannot be modified for different use in the future



Even small buildings are “development” and permits or variances with noted conditions are required. They must be elevated or anchored and built to withstand flood damage.

Caution! Remember, everything inside is likely to get wet when flooding occurs.



Terms and Definitions

Accessory (Appurtenant) Structure

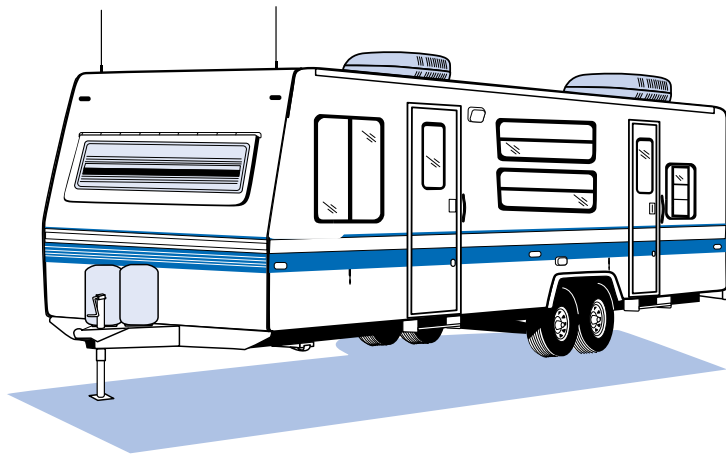
means a structure that is located on the same parcel of land as a principle structure and whose use is incidental to the use of the principle structure. Accessory structures should be no more than a minimal initial investment, may not be used for human habitation, and must be designed to minimize flood damage.

Examples: detached garages, carports, storage sheds, pole barns, and hay sheds.

Recreational Vehicles

In a flood hazard area, an RV must:

- Be licensed and titled as an RV or park model (not as a permanent residence)
- Be built on a single chassis
- Have inflated wheels and be self-propelled or towable by light truck
- Have no attached deck, porch, shed
- Be used for temporary recreational, camping, travel, or seasonal use (no more than 180 days)
- Be less than 400 sq ft in area (measured at largest horizontal projection)
- Have quick-disconnect sewage, water, and electrical connectors



Important Information

Camping near the water?

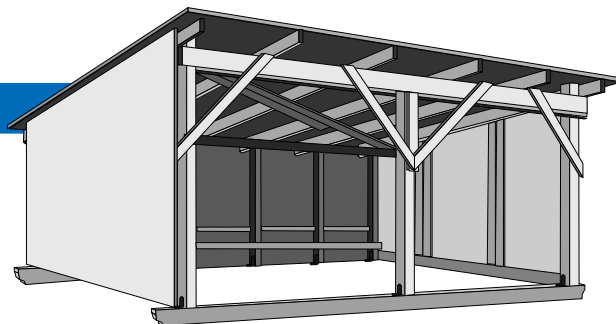
Ask the campground or RV park operator about flood warnings and plans for safe evacuations.

RVs that do not meet these conditions must be installed and elevated like Manufactured Homes, including permanent foundations and tie-downs ([see page 35](#)).

Agricultural Structures

Variances are allowed for:

- Pole frame buildings
- Steel grain bins
- Steel frame corn cribs
- General purpose feeding barns open on one side



Variances are not allowed for:

- Livestock confinement buildings
- Poultry houses
- Dairy operations
- Similar livestock operations



Important

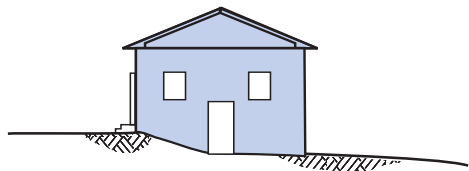
Information

Farm houses are not agricultural structures.

Non-elevated agricultural structures must be considered on a site-specific basis and may be permitted only by variance.

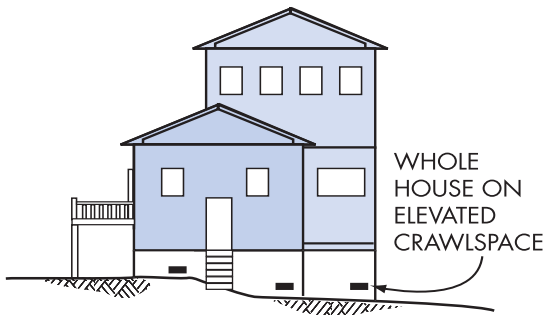
The best flood protection is to elevate agricultural buildings, but certain types can be approved if they are “wet floodproofed.”

Planning to Improve Your Floodplain Building?



Before Improvements

Building Market Value = \$110,000
(excluding land value)



After Improvements

Cost of Improvements = \$68,500
Total Building Value = \$178,500



Terms and Definitions

Substantial improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure (excluding land value) before the improvement is started. This term includes structures which have incurred **substantial damage**, regardless of the actual repair work performed ([see page 43](#)).



Important

Information

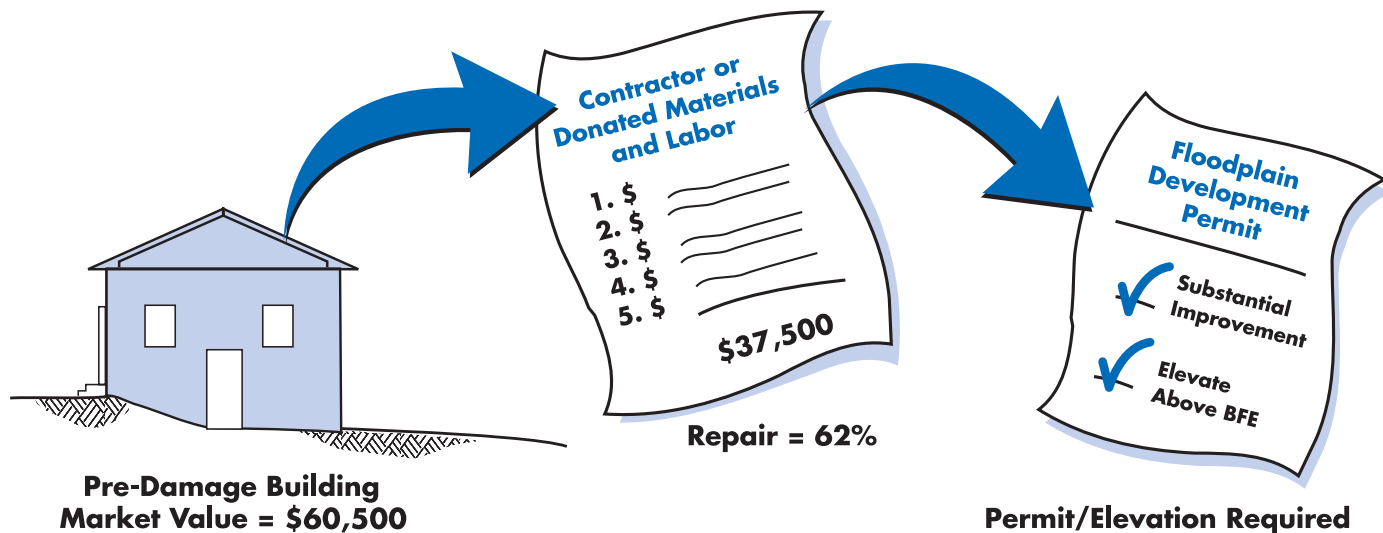
Floodplain buildings can be improved or altered, but special rules may apply!

If the cost of an addition to a Pre-FIRM structure is less than 50% of its market value, only the addition is required to be built above the BFE. Check with your local permit office.

The cost to correct previously cited violations of state or local health, sanitary, or safety code to provide safe living conditions can be excluded.

Alteration of a registered historic structure is allowed, as long as it will continue to meet the criteria for listing as a historic structure.

What About After Damages?



A permit is required to repair substantial damage from any cause — fire, flood, earthquake, wind, or even a truck running into a building. Check with your community permit office to be sure.

You will be asked to provide a detailed cost estimate for repairs. If the cost to repair is 50% or more of the market value, the entire building must be elevated (if damaged by flood, flood insurance may help pay, [see page 44](#)).

[See page 45](#) for more information about elevating an existing building on a crawlspace.

Paying for Post-Flood Compliance

You may be eligible for up to \$30,000 to help pay to protect your building from future flood damage – to bring it into compliance with your community's floodplain requirements – if:

USE THE ICC CLAIM TO:



Elevate on your lot



Demolish the house

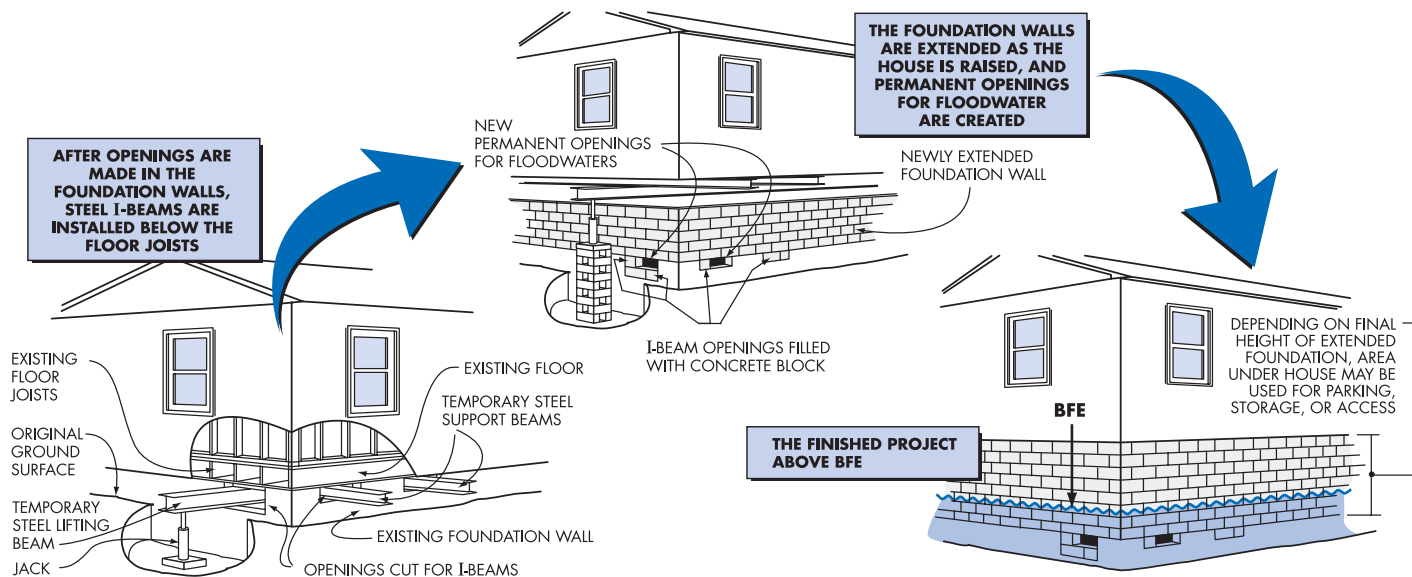


Move the house to high ground

- You have NFIP flood insurance – it includes Increased Cost of Compliance (ICC), coverage.
- Your building is in the mapped Special Flood Hazard Area.
- Your community has made an official determination that the building was substantially damaged by flooding.
- You act quickly to process all the required paperwork.

Owners whose buildings are substantially damaged are required to “bring the building into compliance.” Substantial damage is a special case of substantial improvement ([see page 42](#)).

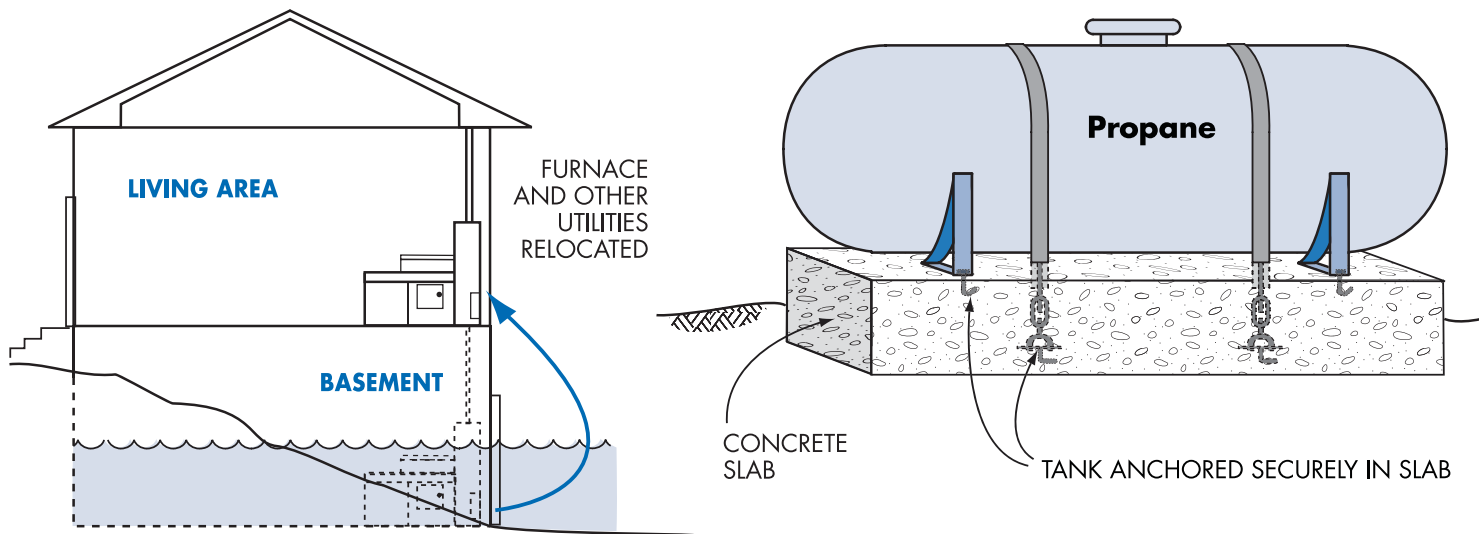
Elevating a Pre-FIRM Building



This is one way to elevate an existing building to comply with floodplain regulations. If your insured building is damaged by flood, you may be eligible for an Increased Cost of Compliance payment ([see page 44](#)).

The state and FEMA can help with more information and options.

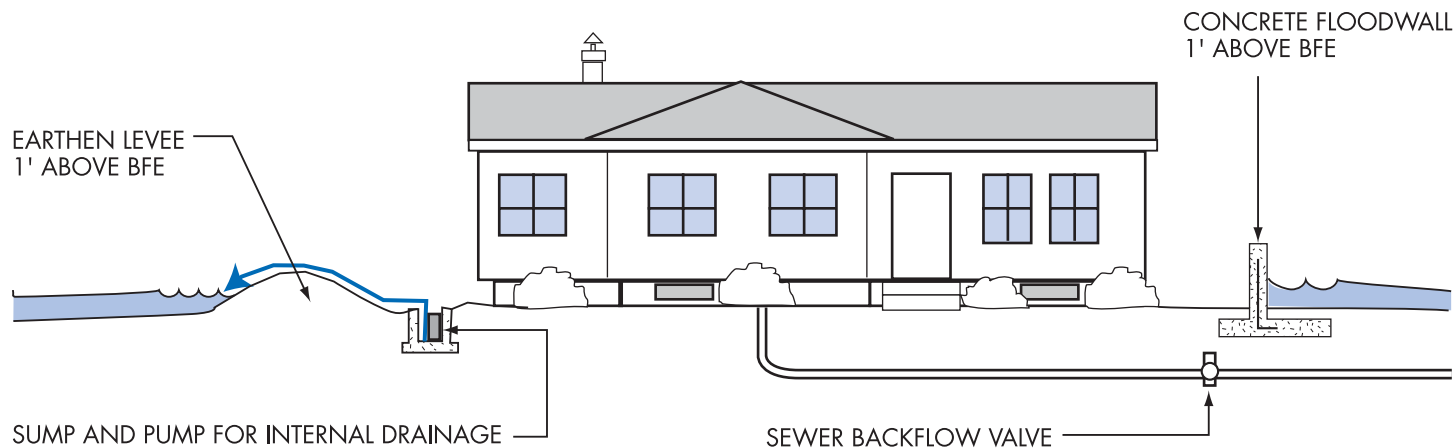
Some Flood Protection for Older Homes is Easy and Low Cost



Move your hot water heater and furnace out of the basement, or build small platforms for them.
If the flood depth is less than 2 feet, build floodwalls or anchor the tanks.

Do not store valuables in a flood-prone basement.
Use water-resistant materials when you repair.

Small Levees and Floodwalls Can Protect Some Older Homes

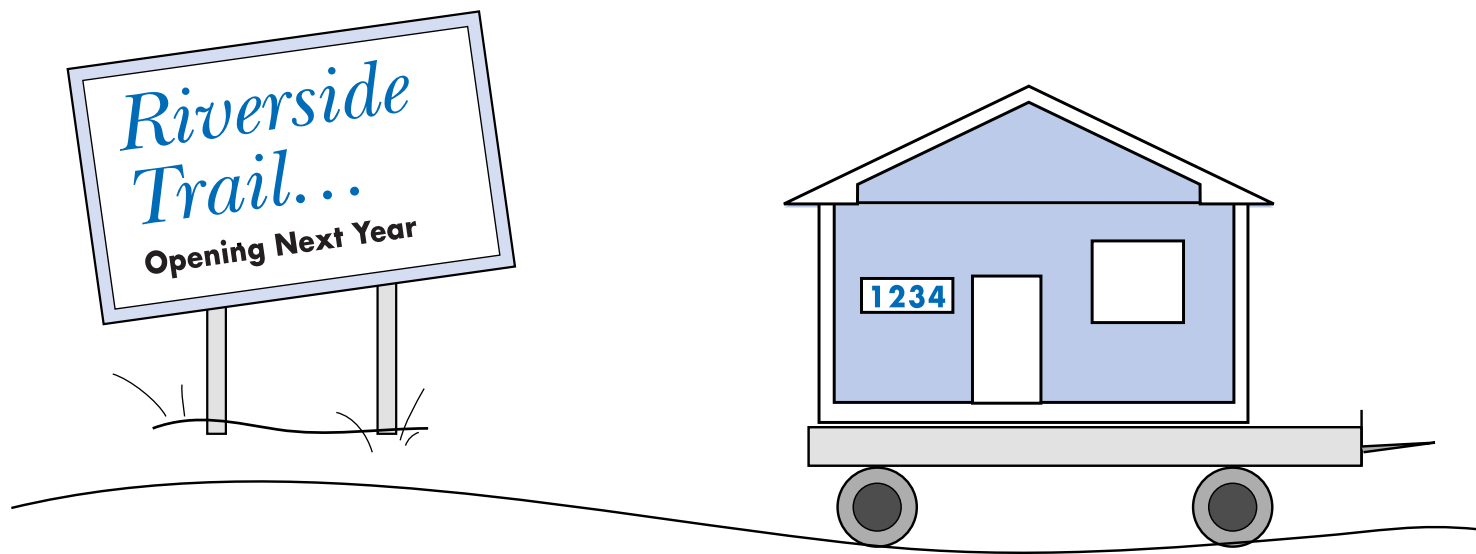


In areas where floodwaters aren't expected to be deep, sometimes individual buildings can be protected by earthen levees or concrete floodwalls. You must get a permit for those protection measures, and extra care must be taken if the site is in a floodway ([see pages 11, 30 and 31](#)). A levee or floodwall cannot be used to protect a new or substantially improved building, or one that is repaired after substantial damage.

Important! These protective measures will not reduce your flood insurance premium!

Some Flood Mitigation Projects are More Costly

But Give You More Protection



After floods, some communities buy out and demolish homes that were severely damaged. The acquired land is dedicated to open space and can be used for recreation or to help restore wildlife habitat and wetlands. Homes have been raised up on higher foundations, and others have been moved to safer high ground.

Useful Resources and Common Acronyms

Useful Resources

- For information on disaster safety, being prepared, and repairing homes, visit the American Red Cross webpage at <http://www.redcross.org/services/disaster>.
- FEMA has developed materials to help families and businesses learn more about preparing for floods and recovering from disasters at <http://www.fema.gov/library>.
- **Utah Division of Emergency Services & Homeland Security:** <http://des.utah.gov>
- **Utah's "Your Family Disaster Plan":** <http://des.utah.gov/prepare/disasterprep.html>

Common Acronyms

- BFE = Base Flood Elevation
- EC = Elevation Certificate
- FEMA = Federal Emergency Management Agency
- FIRM = Flood Insurance Rate Map
- FIS = Flood Insurance Study
- ICC = Increased Cost of Compliance
- MFH = Manufactured Housing/Home
- NFIP = National Flood Insurance Program
- SFHA = Special Flood Hazard Area

Want to Learn More?

- For advice on permits, call your community's building permit office or planning department.
- To order Flood maps, call FEMA's Map Service Center — **1 (800) 358-9616** or order on-line at <http://store.msc.fema.gov>
- To learn more about flood maps and to check the Status of Map Change Requests, click on "Flood Hazard Mapping" at <http://www.fema.gov/fima/>.
- FEMA's on-line publications can be found in the FEMA Virtual Library. Many are posted in the Portable Document Format (PDF). Go to <http://www.fema.gov/library/> for more information. You can order printed copies of FEMA publications from the FEMA Distribution Center, at **1(800) 480-2520**.
- To learn about flood insurance, call your insurance agent. Most insurance companies can write an NFIP policy for you. If you need more help, call the National Flood Insurance Program's toll free number to get the name of an agent in your area who does write flood insurance. The number is **1(888) 356-6329**.
- To get the best rates for flood insurance, call a local surveyor to complete an Elevation Certificate.
- Find out about Elevation Certificate training for surveyors by searching "Elevation Certificate" at <http://www.fema.gov>